



## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

#### **14 CFR Part 39**

**[Docket No. FAA-2021-0197; Project Identifier 2018-SW-107-AD; Amendment 39-21789; AD 2021-22-16]**

**RIN 2120-AA64**

#### **Airworthiness Directives; Airbus Helicopters**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final rule.

**SUMMARY:** The FAA is adopting a new airworthiness directive (AD) for Airbus Helicopters Model EC 155B and EC155B1 helicopters. This AD was prompted by the failure of a main gearbox (MGB) second stage planet gear. This AD requires replacing the MGB, or as an alternative, replacing the epicyclic reduction gear module for certain serial numbered planet gear assemblies installed on the MGB. This AD also requires inspecting the MGB magnetic plugs and MGB filter for particles, and for certain serial-numbered planet gear assemblies, inspecting the oil sump for particles. Depending on the outcome of these inspections, this AD requires further inspections and replacing certain parts. This AD also prohibits installing certain parts. The FAA is issuing this AD to address the unsafe condition on these products.

**DATES:** This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

The Director of the Federal Register approved the incorporation by reference of certain documents listed in this AD as of [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:** For service information identified in this final rule, contact Airbus Helicopters, 2701 North Forum Drive, Grand Prairie, TX 75052; telephone (972) 641-0000 or (800) 232-0323; fax (972) 641-3775; or at <https://www.airbus.com/helicopters/services/technical-support.html>. You may view the referenced service information at the FAA, Office of the Regional Counsel, Southwest

Region, 10101 Hillwood Pkwy., Room 6N-321, Fort Worth, TX 76177. For information on the availability of this material at the FAA, call (817) 222-5110. Service information that is incorporated by reference is also available at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2021-0197.

### **Examining the AD Docket**

You may examine the AD docket at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2021-0197; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, the European Aviation Safety Agency (now European Union Aviation Safety Agency) (EASA) AD, any comments received, and other information. The street address for Docket Operations is U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.

**FOR FURTHER INFORMATION CONTACT:** Rao Edupuganti, Aerospace Engineer, Dynamic Systems Section, Technical Innovation Policy Branch, Policy & Innovation Division, FAA, 10101 Hillwood Pkwy., Fort Worth, TX 76177; telephone (817) 222-5110; email [rao.edupuganti@faa.gov](mailto:rao.edupuganti@faa.gov).

### **SUPPLEMENTARY INFORMATION:**

#### **Background**

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to Airbus Helicopters Model EC 155B and EC155B1 helicopters. The NPRM published in the *Federal Register* on July 22, 2021 (86 FR 38608). In the NPRM, the FAA proposed to require for helicopters with at least one Type Y planet gear assembly with a certain serial number (S/N) installed, or at least one Type Z planet gear assembly with a certain S/N installed, within 10 hours time-in-service (TIS) after the effective date of the AD and thereafter at intervals not to exceed 10 hours TIS, inspecting the MGB magnetic plugs for particles. If there are particles, the NPRM proposed to require further inspections and analyses and replacing the MGB, depending on the type and the size of the particles.

The NPRM also proposed to require for helicopters with a Type Y planet gear assembly with a certain S/N installed, within 25 hours TIS after the effective date of the AD, inspecting the MGB filter for particles. If there are particles, the NPRM proposed to require further inspections and analyses and replacing the MGB, depending on the type and the size of the particles. The NPRM proposed to require for helicopters with at least one Type Y planet gear assembly with a certain S/N installed, within 50 hours TIS after the effective date of the AD, replacing the MGB. As an alternative to replacing the MGB, the NPRM would allow replacing the epicyclic reduction gear in the affected MGB.

Additionally, the NPRM proposed to require, for helicopters without any Type Y planet gear assembly but at least one Type Z planet gear assembly with a certain S/N installed, replacing the MGB within 50 hours TIS after the effective date of the AD or before any planet gear assembly accumulates 1,800 total hours TIS, whichever occurs later. As an alternative to replacing the MGB, the NPRM would allow replacing the epicyclic reduction gear in the affected MGB.

The NPRM also proposed to require, for helicopters with at least one Type Z planet gear with a certain S/N installed, within certain compliance times specified in the figures in this AD, inspecting the MGB filter and inspecting the oil sump for particles. If there are particles, the NPRM proposed to require further inspections and analyses, and replacing the MGB, depending on the type and the size of the particles.

The NPRM also proposed to prohibit installing an MGB with a certain serial numbered Type Y planet gear assembly and proposed to prohibit installing a Type Y planet gear assembly with a certain S/N on any helicopter.

Additionally, the NPRM proposed to prohibit installing certain serial numbered Type Z planet gear assemblies that have accumulated 1,800 or more total hours TIS and prohibit installing an MGB with certain serial numbered Type Z planet gear assemblies that have accumulated 1,800 or more total hours TIS.

Finally, the NPRM proposed to prohibit installing an MGB if the type of the planet gear assembly cannot be determined and also prohibit installing any planet gear assembly if the type cannot be determined.

The NPRM was prompted by EASA AD 2018-0263, dated December 7, 2018 (EASA AD 2018-0263), issued by EASA, which is the Technical Agent for the Member States of the European Union, to correct an unsafe condition for Airbus Helicopters Model EC 155 B and EC 155 B1 helicopters. EASA advises that after an accident on a Model EC225 helicopter, an investigation revealed the failure of an MGB second stage planet gear. EASA states that one of the two types of planet gear used in the MGB epicyclic module is subject to higher outer race contact pressures and therefore is more susceptible to spalling and cracking. This condition, if not addressed, could result in failure of a MGB planet gear assembly, failure of the MGB, and subsequent loss of helicopter control.

Accordingly, EASA AD 2018-0263 requires repetitive inspections of the MGB magnetic plugs, the MGB filer, and the oil sump for particles, and depending on the results of those inspections, removing or replacing certain parts. EASA AD 2018-0263 also requires reducing the life limit of Type Z planet gear assemblies. EASA AD 2018-0263 also requires, if certain gear assemblies are installed, either replacing the MGB or replacing the epicyclic reduction gear. Finally, EASA AD 2018-0263 prohibits installing a Type Y planet gear assembly or an MGB with a Type Y planet gear assembly on any helicopter.

## **Discussion of Final Airworthiness Directive**

### **Comments**

The FAA received comments from one commenter. The following presents the comments received on the NPRM and the FAA's response.

### **Request to Revise the Required Actions Section of the NPRM**

Airbus Helicopters Inc., requested that the FAA revise the Required Actions section of this AD dealing with the 25 hours TIS inspection for the oil sump (also referred to as inspecting the bottom housing of the MGB) by removing that repetitive inspection and explained that some of the proposed actions are unclear and not in line with the original equipment manufacturer's (OEM) service information. The commenter also provided an example of a similar AD, AD 2021-12-06, Amendment 39-21593 (86 FR 31612, June 15, 2021) (AD 2021-12-06), stating that AD 2021-12-06 is clear in

explaining both the required repetitive actions and the limits provided by the OEM for the MGB oil filter inspection after finding particle(s) on the chip detector. The commenter stated that, as written, the proposed actions would create extra work, which could lead to an unwanted condition exposing the dynamic component to possible contamination and possibly foreign object debris.

The FAA agrees that the repetitive 25 hours TIS oil sump inspection for Type Y planet gears is not necessary and has revised paragraph (g)(1) of the Required Actions section in this final rule by deleting this inspection.

### **Conclusion**

The FAA reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting this AD as proposed, except for the change described previously, updating the service information for the optional replacement of the epicyclic reduction gear module in paragraphs (g)(3) and (4) of this AD, and for clarity, deleting the corrective actions when there are no 16NCD13 particles. The FAA has determined that these changes will not increase the economic burden on any operator or increase the scope of this final rule.

### **Related Service Information Under 1 CFR Part 51**

The FAA reviewed Airbus Helicopters Alert Service Bulletin ASB No. EC155-05A034, Revision 5, dated December 4, 2018 (ASB EC155-05A34 Rev 5) for Model EC 155 helicopters, which specifies periodic inspections of the MGB magnetic plugs, the MGB filter, and the oil sump for particles. ASB EC155-05A34 Rev 5 also specifies identifying the type of gear assembly installed in the MGB and replacing any Type Y planet gear assembly within 50 hours TIS. For Type Z gear assemblies that have logged less than 1,800 hours TIS since new, this service information specifies replacing the gear assembly before exceeding 1,800 total hours TIS, and for Type Z gear assemblies that have logged 1,800 or more total hours TIS, replacing the gear assembly within 600 hours TIS.

The FAA also reviewed Airbus Helicopters Service Bulletin SB No. EC155-63-016, Revision 5, dated March 6, 2019, for Model EC 155 helicopters. This service information specifies procedures for replacing the MGB epicyclic reduction gear without

removing the MGB.

This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in the ADDRESSES section.

#### **Interim Action**

The FAA considers this AD to be an interim action. If final action is later identified, the FAA might consider further rulemaking then.

## **Differences Between this AD and EASA AD 2018-0263**

EASA AD 2018-0263 specifies compliance times based on flight hours and calendar dates. This AD sets compliance times based on hours TIS or before further flight. EASA AD 2018-0263 allows a pilot to inspect the MGB magnetic plugs for particles, while this AD does not. For helicopters with at least one affected Type Z planet gear assembly that has accumulated 1,800 or more total hours TIS installed, EASA AD 2018-0263 requires replacing the MGB or epicyclic reduction gear within 600 flight hours after March 16, 2018, whereas this AD requires either of those replacements within 50 hours TIS after the effective date of this AD instead. If 16NCD13 particles are present, EASA AD 2018-0263 requires taking a 1 liter sample of oil and returning it to Airbus Helicopters and removing the MGB for depot-level inspection, whereas this AD requires replacing the MGB instead.

## **Costs of Compliance**

The FAA estimates that this AD affects 14 helicopters of U.S. Registry. Labor rates are estimated at \$85 per work-hour. Based on these numbers, the FAA estimates the following costs to comply with this AD.

Inspecting the magnetic plugs for particle deposits takes about 1 work-hour for an estimated cost of \$85 per helicopter per inspection cycle.

Inspecting the MGB filter or oil sump for particle deposits takes about 1 work-hour for an estimated cost of \$85 per helicopter per inspection cycle.

Replacing an MGB takes about 42 work-hours, and parts cost about \$295,000 (overhauled) for an estimated total cost of \$298,570 per helicopter.

Replacing the epicyclic reduction gear takes about 56 work-hours and parts cost about \$11,404 for an estimated total cost of \$16,164 per helicopter.

## **Authority for this Rulemaking**

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: General requirements. Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on helicopters identified in this rulemaking action.

### **Regulatory Findings**

This AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that this AD:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Will not affect intrastate aviation in Alaska, and
- (3) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

### **List of Subjects in 14 CFR Part 39**

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

### **The Amendment**

Accordingly, under the authority delegated to me by the Administrator, the FAA amends 14 CFR part 39 as follows:

### **PART 39 - AIRWORTHINESS DIRECTIVES**

- 1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

### **§ 39.13 [Amended]**

- 2. The FAA amends § 39.13 by adding the following new airworthiness directive:

**2021-22-16 Airbus Helicopters:** Amendment 39-21789; Docket No. FAA-2021-0197; Project Identifier 2018-SW-107-AD.



**(a) Effective Date**

This airworthiness directive (AD) is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**(b) Affected ADs**

None.

**(c) Applicability**

This AD applies to Airbus Helicopters Model EC 155B and EC155B1 helicopters, certificated in any category.

**(d) Subject**

Joint Aircraft Service Component (JASC) Code: 6300, Main Rotor Drive System.

**(e) Unsafe Condition**

This AD was prompted by the failure of a main gearbox (MGB) second stage planet gear. The FAA is issuing this AD to prevent failure of an MGB planet gear assembly. The unsafe condition, if not addressed, could result in failure of the MGB and subsequent loss of helicopter control.

**(f) Compliance**

Comply with this AD within the compliance times specified, unless already done.

**(g) Required Actions**

(1) For helicopters with at least one Type Y planet gear assembly with a serial number (S/N) listed in Appendix 4.A. of Airbus Helicopters Alert Service Bulletin ASB No. EC155-05A034, Revision 5, dated December 4, 2018 (ASB EC155-05A034 Rev 5) or with at least one Type Z planet gear assembly with an S/N listed in Appendix 4.B. of ASB EC155-05A034 Rev 5 installed, within 10 hours time-in-service (TIS) after the effective date of this AD, and thereafter at intervals not to exceed 10 hours TIS, inspect the MGB magnetic plugs for particles. If there are any particles that consist of any scale, flake, splinter, or other particle other than cotter pin fragments, pieces of lock wire, swarf, abrasion, or miscellaneous non-metallic waste, and any of the planet gears have accumulated less than 50 total hours TIS, before further flight, inspect the MGB filter for particles. Thereafter, for 25 hours TIS, continue to inspect the MGB plugs for particles before each flight, inspect the MGB filter for particles at intervals not to exceed 25 hours TIS, and inspect the cumulative surface area of the particles collected from the magnetic plugs, the MGB filter, since last MGB overhaul, or since new if no overhaul has been performed.

Note 1 to the introductory text of paragraph (g)(1): Airbus Helicopters service information refers to an MGB filter as an oil filter.

(i) If the total surface area of the particles is less than 3 mm<sup>2</sup>, examine the particles with the largest surface area (S), greatest length (L), and greatest thickness (e).

(A) If any (S) of all of the particles is less than or equal to 1 mm<sup>2</sup>, the (L) is less than or equal to 1.5 mm, and the (e) is less than or equal to 0.2 mm, inspect the MGB plugs for particles before further flight, and inspect the MGB filter for particles within 25 hours TIS. Thereafter:

(1) For 25 hours TIS, continue to inspect the MGB plugs for particles before each flight and perform the actions required by paragraphs (g)(1)(i) and (ii) of this AD.

(2) Inspect the MGB filter for particles at intervals not to exceed 25 hours TIS and perform the actions required by paragraphs (g)(1)(i) and (ii) of this AD.

(B) If any (S) is greater than 1 mm<sup>2</sup>, (L) is greater than 1.5 mm, or (e) is greater than 0.2 mm, perform a metallurgical analysis for any 16NCD13 particles, using a method in accordance with FAA-approved procedures.

(C) If there are any 16NCD13 particles, before further flight, replace the MGB with an airworthy MGB.

(ii) If the total surface area of collected particles is greater than or equal to 3 mm<sup>2</sup>, before further flight, perform a metallurgical analysis for any 16NCD13 particles using a method in accordance with FAA-approved procedures. If there are any 16NCD13 particles, before further flight, replace the MGB with an airworthy MGB.

(2) For helicopters with at least one Type Y planet gear assembly with an S/N listed in Appendix 4.A. of ASB EC155-05A034 Rev 5 installed, within 25 hours TIS after the effective date of this AD, inspect the MGB filter for particles. If there are any particles that consist of any scale, flake, splinter, or particle other than cotter pin fragments, pieces of lock wire, swarf, abrasion, or miscellaneous non-metallic waste, and any of the planet gears have accumulated more than 50 total hours TIS, before further flight, perform the actions required by paragraphs (g)(1)(i) and (ii) of this AD.

(3) For helicopters with at least one Type Y planet gear assembly with an S/N listed in Appendix 4.A. of ASB EC155-05A034 Rev 5 installed, within 50 hours TIS after the effective date of this AD, replace the MGB or as an alternative to replacing an affected MGB, replace the epicyclic reduction gear module in the affected MGB in accordance with paragraph 3.B.2. of the Accomplishment Instructions of Airbus Helicopters Service Bulletin SB No. EC155-63-016, Revision 5, dated March 6, 2019 (SB EC155-63-016 Rev 5), except you are not required to contact Airbus Helicopters.

(4) For helicopters without any Type Y planet gear assembly installed but with at least one Type Z planet gear assembly with an S/N listed in Appendix 4.B. of ASB EC155-05A034 Rev 5 installed, within 50 hours TIS after the effective date of this AD, or before any gear accumulates 1,800 total hours TIS, whichever occurs later, replace the MGB or as an alternative to replacing an affected MGB, replace the epicyclic reduction gear module in the affected MGB in accordance with paragraph 3.B.2. of the Accomplishment Instructions of SB EC155-63-016 Rev 5, except you are not required to

contact Airbus Helicopters.

(5) For helicopters with at least one Type Z planet gear assembly with an S/N listed in Appendix 4.B. of ASB EC155-05A034 Rev 5 installed, inspect the MGB filter for particles within the compliance times specified in Figure 1 to paragraph (g)(5) of this AD and inspect the oil sump for particles within the compliance times specified in Figure 2 to paragraph (g)(5) of this AD, based on the total hours TIS accumulated by the Type Z planet gear with the most total hours TIS accumulated since first installation in an MGB. If there are particles, before further flight, perform the actions required by paragraphs (g)(1)(i) and (ii) of this AD.

<b>Total Hours TIS Accumulated</b>	<b>Compliance Time for Initial Inspection</b>	<b>Compliance Time for Repetitive Inspections</b>
Less than 400 total hours TIS	Within 55 hours TIS after the effective date of this AD	Within 55 hours TIS
400 or more total hours TIS	Within 25 hours TIS after the effective date of this AD	Within 25 hours TIS

Figure 1 to Paragraph (g)(5)

<b>Total Hours TIS Accumulated</b>	<b>Compliance Time for Initial Inspection</b>	<b>Compliance Time for Repetitive Inspections</b>
Less than 400 total hours TIS	Before exceeding 400 hours TIS after the effective date of this AD	Within 55 hours TIS
400 or more total hours TIS	Within 55 hours TIS after the effective date of this AD	Within 55 hours TIS

Figure 2 to Paragraph (g)(5)

(6) As of the effective date of this AD, do not install a type Y planet gear assembly with an S/N listed in Appendix 4.A. of ASB EC155-05A034 Rev 5 on any helicopter, and do not install an MGB with a Type Y planet gear assembly with an S/N

listed in Appendix 4.A. of ASB EC155-05A034 Rev 5 on any helicopter.

(7) As of the effective date of this AD, do not install a Type Z planet gear assembly with an S/N listed in Appendix 4.B. of ASB EC155-05A034 Rev 5 that has accumulated 1,800 or more total hours TIS on any helicopter, and do not install an MGB with at least one Type Z planet gear assembly with an S/N listed in Appendix 4.B. of ASB EC155-05A034 Rev 5 that has accumulated 1,800 or more total hours TIS on any helicopter.

(8) As of the effective date of this AD, do not install any planet gear on any helicopter if the planet gear assembly type cannot be determined, and do not install any MGB on any helicopter if any of the planet gear assembly types cannot be determined.

**(h) Alternative Methods of Compliance (AMOCs)**

(1) The Manager, International Validation Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the International Validation Branch, send it to the attention of the person identified in paragraph (i)(1) of this AD. Information may be emailed to: 9-AVS-AIR-730-AMOC@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

**(i) Related Information**

(1) For more information about this AD, contact Rao Edupuganti, Aerospace Engineer, Dynamic Systems Section, Technical Innovation Policy Branch, FAA, 10101 Hillwood Pkwy., Fort Worth, TX 76177; telephone (817) 222-5110; email rao.edupuganti@faa.gov @faa.gov.

(2) The subject of this AD is addressed in European Aviation Safety Agency (now European Union Aviation Safety Agency) (EASA) AD 2018-0263, dated December 7, 2018. You may view the EASA AD at <https://www.regulations.gov> in Docket No. FAA-2021-0197.

**(j) Material Incorporated by Reference**

(1) The Director of the Federal Register approved the incorporation by reference of the service information listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this service information as applicable to do the actions required by this AD, unless the AD specifies otherwise.

(i) Airbus Helicopters Alert Service Bulletin ASB No. EC155-05A034, Revision 5, dated December 4, 2018.

(ii) Airbus Helicopters Service Bulletin SB No. EC155-63-016, Revision 5, dated March 6, 2019.

(3) For service information identified in this AD, contact Airbus Helicopters, 2701 North Forum Drive, Grand Prairie, TX 75052; telephone (972) 641-0000 or (800) 232-0323; fax (972) 641-3775; or at <https://www.airbus.com/helicopters/services/technical-support.html>.

(4) You may view this service information at the FAA, Office of the Regional Counsel, Southwest Region, 10101 Hillwood Pkwy., Room 6N-321, Fort Worth, TX 76177. For information on the availability of this material at the FAA, call (817) 222-5110.

(5) You may view this service information that is incorporated by reference at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, email: [fr.inspection@nara.gov](mailto:fr.inspection@nara.gov), or go to: <https://www.archives.gov/federal-register/cfr/ibr-locations.html>.

Issued on October 19, 2021.

Lance T. Gant, Director,  
Compliance & Airworthiness Division,  
Aircraft Certification Service.

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